

# Notes on a collection of bats and observations on other vertebrates from the Macquarie Marshes, New South Wales

Peter Wilson, Murray Ellis and Ray Williams

Mammal Section, Royal Zoological Society of New South Wales

From 25 to 31 March, 1989, the Mammal Section of the Royal Zoological Society of NSW conducted a fauna survey of part of the Macquarie Marshes Nature Reserve. The primary purpose of our survey was to add to the knowledge of the mammalian fauna of the Marshes since the avifauna and herpetofauna have been well surveyed (Brooker and Wombley 1986; Cooper 1954). This note presents a summary of bat captures and incidental observations of other vertebrates made during the recent Mammal Section survey.

Macquarie Marshes Nature Reserve is situated approximately 100 km north of Warren in central western New South Wales (Fig. 1). The reserve is covered by large areas of wetland vegetation, and significant areas of eucalypt woodland dominated by River Red Gum *Eucalyptus camaldulensis*. There are also extensive areas of dead standing and fallen timber in former woodland apparently killed by changes in water regime associated with the construction of irrigation works. A more detailed description can be found in Pajmans (1981) and NPWS (1990).

The trapping period was characterized by heavy rainfall and localized flooding. The associated cloud cover resulted in low temperatures and high humidity. Flooding meant that live trapping using Elliott traps was abandoned after two nights, with only introduced rodents being captured. Spotlighting was similarly limited in extent and duration, but did reveal Common Brushtail Possums *Trichosurus vulpecula*.

Bat traps and mistnets were set in an area of River Red Gum woodland flanked on one side by a man-made irrigation channel, and on the other by natural waterways. Four harp-type bat traps and one mistnet were set for two nights. All traps were set on an access road, and the mistnet was set along the margin of a large open marsh area. An additional net, set under a large Black Box *E. largiflorens*, was maintained for three nights. All bat captures were made within 1 000 m of 30°45'28"S 147°32'28"E. The location of all trapping sites is shown in Figure 2.

A spotlighting transect was run for one night and ran from the bat trapping site to the Elliot trapping site (Fig. 2).

The species captured, detailed live measurements, and method of capture are listed in Table 1. Also included are the Australian Museum accession numbers of voucher specimens taken from the field. A list of all other terrestrial vertebrate species recorded from the Marshes during the survey is given in Appendix 1. The data have been supplied to the NSW NPWS "Atlas of NSW Wildlife", described by Ellis (1992), and confirms the continued presence of many species previously recorded from the Macquarie Marshes.

The most notable captures were a number of specimens of Gould's Long-eared Bat *Nyctophilus gouldi*. This represents a significant westward range extension for this species of approximately 180 km (Ellis *et al.* 1989). The identity of three voucher specimens lodged with the Australian Museum was kindly confirmed by Dr. Harry Parnaby.

Based on our field observations, the western form of *N. gouldi* can be distinguished from sympatric Lesser Long-eared Bat *N. geoffroyi* by the same characters that are of value in separating eastern specimens of these species. That is, relatively longer ears in *N. geoffroyi*, and tall, slender Y-shaped posterior noseleaf element in *N. geoffroyi*. With respect to the noseleaf types defined by Thomas (1915), and refined by Churchill *et al.* (1984), *N. geoffroyi* is Type 3, and *N. gouldi* is Type 1. They are, however, very similar in size in western NSW (Ellis *et al.* 1989; Table 1, this study). These new specimens are further evidence of the wide degree of intraspecific variation in *N. gouldi* noted by Parnaby (1987 and pers. comm.).

The similarity in size noted above suggests that absolute size might not be a significant factor determining the niche of each species at the western limit of their zone of sympatry. Larger sample sizes and detailed ecological study will be required to examine this possibility. Interestingly, studies have shown the two species to have remarkably similar echolocation calls

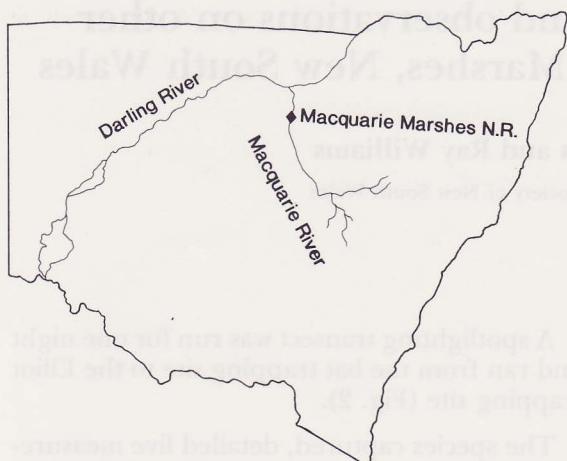


Fig. 1. Location of Macquarie Marshes Nature Reserve.

(Woodside and Taylor 1985), and methods of prey capture (Grant 1991).

Although no specimens were captured, incidental evidence suggests the presence of at least three other species of microchiropterans in the Marshes. A probable specimen of *Chalinolobus picatus* escaped from a mistnet before it was secured. The range of this species includes the Marshes area, and it was recently captured north of Bourke, NSW (Ellis and Wilson 1992). On several occasions in one night, spotlighting revealed the presence of a high-flying, very large pale-bellied bat that was probably the Yellow-bellied Sheat-tail Bat *Saccopteryx flaviventris*. Spotlighting also revealed a large fast-flying bat whose call was clearly audible, probably the White-striped Mastiff Bat *Tadarida australis* or possibly Gould's Wattled Bat *Chalinolobus gouldii*, flying above the River Red Gum woodland.

Other bat species expected from the area, but not captured during this survey include *Eptesicus baverstocki*, *Scotorepens balstoni* and *Nyctophilus timoriensis*.

General observations and spotlighting indicate that greatest bat activity occurred around the Red Gum woodland and adjacent water bodies. These areas represent zones of relatively high productivity in arid and semi-arid western NSW. Together with the captures, these observations suggest that the woodlands associated with major drainage channels in western NSW are significant habitat for microchiropterans, and should be subjected to more intensive survey. Furthermore, the conservation of the woodlands is apparently a necessary condition for the conservation of the microchiropteran fauna of the region.

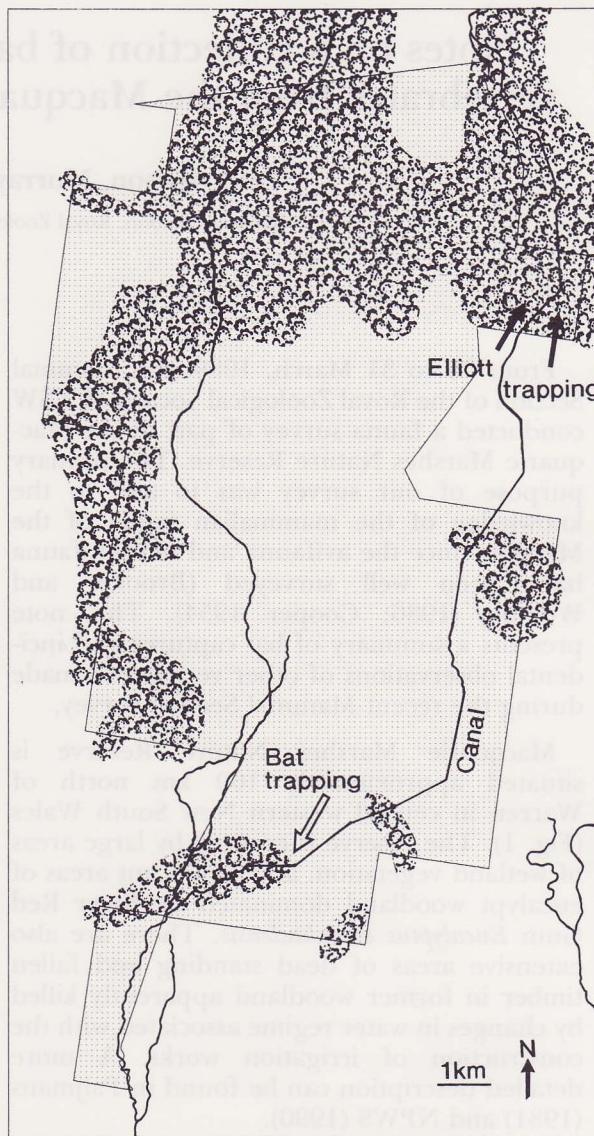


Fig. 2. Northern section of Macquarie Marshes Nature Reserve (light stippling) showing the location of trapping sites and the spotlighting transect in relation to woodland (stippled).

## ACKNOWLEDGEMENTS

Thanks are due to the other members of the survey team: Anne, Amy, and Tanya Williams, Jim and Mariane Cochrane, Pavel German, and Anne Parson. We are grateful for the co-operation and encouragement of Kath Ireland, then NPWS District Naturalist, Coonabarabran, and other NPWS District staff.

## REFERENCES

- BROOKER, M. AND WOMBEY, J., 1986. Some observations on the herpetofauna of the Macquarie Marshes region, NSW, with special reference to the Chelidae. *Aust. Zool.* 23: 1–4.
- CHURCHILL, S. K., HALL, L. S., AND HELMAN, P. M., 1984. Observations on long-eared bats (Vespertilionidae: *Nyctophilus*) from northern Australia. *Aust. Mamm.* 7: 17–28.

- COOPER, R. P., 1954. Birds of the Macquarie Marshes, New South Wales. *Mem. Nat. Mus. Vict.* **19**: 137-63.
- ELLIS, M., 1992. Revision of the Atlas of New South Wales Wildlife. *Australian Zoologist* **28**: 59-64.
- ELLIS, M. V., WILLIAMS, C. R. AND WILSON, P., 1989. Extension of the known range of Gould's Long-eared Bat *Nyctophilus gouldi* Tomes, 1858 (Chiroptera: Vesperilionidae) in New South Wales. *Aust. Zool.* **25**: 79-82.
- ELLIS, M. AND WILSON, P., 1992. An overview of the vertebrate fauna of the Brigalow belt north-east of Bourke, NSW. Unpublished report to the Western Lands Commission.
- GRANT, J. D. A., 1991. Prey location by two Australian long-eared bats, *Nyctophilus gouldi* and *N. geoffroyi*. *Aust. J. Zool.* **39**: 45-56.
- NATIONAL PARKS AND WILDLIFE SERVICE, 1990. *Macquarie Marshes Draft Plan of Management*. New South Wales National Parks and Wildlife Service : Hurstville, New South Wales.

*Table 1.* Bat captures at Macquarie Marshes Nature Reserve, March 1989. Abbreviations used: FA = Forearm in millimetres, BM = Body mass in grams, HB = Head and body in millimetres, T = Tail in millimetres, Ear = Ear in millimetres, WS = Wingspan in millimetres. All measurements are from live specimens.

| Species                      | Sex | FA   | BM   | HB   | T    | Ear  | WS  | Trap site | Australian Museum Number |
|------------------------------|-----|------|------|------|------|------|-----|-----------|--------------------------|
| <i>Chalinolobus gouldii</i>  | M   | 43.7 | 12.2 | —    | —    | —    | 317 | RGT       |                          |
|                              | M   | 41.2 | 10.0 | —    | —    | —    | 300 | RGT       |                          |
|                              | M   | 42.8 | 12.0 | —    | —    | —    | 310 | RGT       |                          |
|                              | M   | 42.9 | 12.0 | 58.0 | 46.0 | 15.8 | 310 | RGT       | M20380                   |
|                              | F   | 46.1 | 13.8 | 60.4 | 49.6 | 15.6 | 328 | RGT       | M20379                   |
| <i>Eptesicus vulturinus</i>  | M   | 26.0 | 3.0  | —    | —    | —    | 192 | RGT       | M20381                   |
|                              | M   | 25.8 | 3.5  | 39.4 | 32.5 | 9.6  | 195 | RGT       | M20378                   |
| <i>Nyctophilus geoffroyi</i> | M   | 33.7 | 6.0  | —    | —    | —    | —   | UB        | M20367                   |
|                              | M   | 34.4 | 6.0  | —    | —    | —    | —   | BB        |                          |
|                              | M   | 34.6 | 5.8  | 48.9 | 42.8 | 25.9 | 248 | RGT       | M20371                   |
|                              | M   | 33.2 | 6.2  | 46.5 | 47.0 | 25.9 | 248 | RGT       | M20372                   |
|                              | M   | 31.9 | 5.0  | 43.6 | 48.0 | 24.1 | 227 | RGT       | M20373                   |
|                              | M   | 34.0 | 5.2  | 45.0 | 39.0 | 25.4 | 250 | RGT       | M20376                   |
|                              | M   | 34.2 | 5.5  | 43.0 | 39.5 | 25.2 | 243 | RGT       | M20377                   |
|                              | F   | 36.0 | 6.2  | 49.0 | 39.0 | —    | 256 | BB        |                          |
|                              | F   | 36.8 | 7.0  | 45.9 | 44.5 | 26.2 | 265 | RGT       | M20374                   |
|                              | F   | 35.3 | 6.0  | 43.3 | 40.3 | 25.4 | 256 | RGT       | M20375                   |
| <i>Nyctophilus gouldi</i>    | M   | 35.2 | 6.5  | 50.0 | 35.5 | 26.0 | 250 | RGT       | M20382                   |
|                              | M   | 36.8 | 6.5  | 46.8 | 43.6 | 27.0 | 261 | RGT       | M20369                   |
|                              | F   | 39.6 | 7.5  | 47.4 | 43.7 | 26.9 | 275 | RGT       | M20370                   |
| <i>Scotorepens greyii</i>    | M   | 29.2 | 6.0  | —    | —    | —    | 220 | RGT       | M20386                   |
|                              | M   | 27.2 | 6.2  | —    | —    | —    | 213 | RGT       | M20385                   |
| <i>Mormopterus planiceps</i> | M   | 32.4 | 10.0 | —    | —    | —    | 242 | RGN       | M20383                   |

SITES: BB: Mist net set under Black Box for three nights.

UB: Caught by hand, found under the bark of a dead tree.

RGN: Mist net set between two River Red Gums adjacent to open marsh area.

RGT: Bat trap set on access road in River Red Gum woodland.

## APPENDIX

List of all terrestrial vertebrate species except bats (Order Chiroptera) recorded from the Macquarie marshes during the survey period, and held in the NSW NPWS "Atlas of NSW Wildlife". Seventy-two terrestrial vertebrate species are listed below.

|   |  |   |
|---|--|---|
| <b>Class Amphibia</b>                                   | <b>Family Rallidae</b>                               | <b>Order Strigiformes</b>   |
| Order Salientia   | <i>Gallinula ventralis</i> (Black-tailed Native-hen) | Family Strigidae  |
| Family Hylidae  |  | <i>Ninox novaeseelandiae</i> (Southern Boobook)   |
| <i>Litoria caerulea</i> (Green Tree Frog)               |  |   |
| <i>Litoria peronii</i> (Peron's Tree Frog)              |  |   |
| Family Myobatrachidae                                   |  | <b>Class Mammalia</b>   |
| <i>Limnodynastes fletcheri</i> (Long-thumbed Frog)      |  | Order Artiodactyla  |
| <i>Limnodynastes tasmaniensis</i> (Spotted Grass Frog)  |  | Family Bovidae  |
|   |  | <i>Bos taurus</i> (Cattle (feral))  |
| <b>Class Aves</b>                                       |  | Family Suidae   |
| Order Anseriformes                                      |  | <i>Sus scrofa</i> (Pig (feral))   |
| Family Anatidae   |  | Order Carnivora   |
| <i>Anas superciliosa</i> (Pacific Black Duck)           |  | Family Canidae  |
| <i>Cygnus atratus</i> (Black Swan)                      |  | <i>Vulpes vulpes</i> (Fox)  |
| Order Caprimulgiformes                                  |  | Order Diprotodontia   |
| Family Aegothelidae                                     |  | Family Macropodidae   |
| <i>Aegotheles cristatus</i> (Australian Owlet-nightjar) |  | <i>Macropus giganteus</i> (Eastern Grey Kangaroo)   |
| Family Podargidae                                       |  | Family Phalangeridae  |
| <i>Podargus strigoides</i> (Tawny Frogmouth)            |  | <i>Trichosurus vulpecula</i> (Common Brushtail Possum)  |
| Order Charadriiformes                                   |  | Order Lagomorpha  |
| Family Charadriidae                                     |  | Family Leporidae  |
| <i>Vanellus miles</i> (Masked Lapwing)                  |  | <i>Lepus capensis</i> (Brown Hare)  |
| Order Ciconiiformes                                     |  | Order Rodentia  |
| Family Ardeidae   |  | Family Muridae  |
| <i>Ardea novaehollandiae</i> (White-faced Heron)        |  | <i>Hydromys chrysogaster</i> (Water Rat)<br><i>Mus musculus</i> (House Mouse)<br><i>Rattus rattus</i> (Black Rat)   |
| Family Plataleidae                                      |  | <b>Class Reptilia</b>   |
| <i>Platalea flavipes</i> (Yellow-billed Spoonbill)      |  | Order Squamata  |
| <i>Platalea regia</i> (Royal Spoonbill)                 |  | Family Agamidae   |
| <i>Threskiornis aethiopicus</i> (Sacred Ibis)           |  | <i>Pogona barbata</i> (Bearded Dragon)  |
| <i>Threskiornis spinicollis</i> (Straw-necked Ibis)     |  | Family Elapidae   |
| Order Columbiformes                                     |  | <i>Pseudechis porphyriacus</i> (Red-bellied Black Snake)  |
| Family Columbidae                                       |  | Family Gekkonidae   |
| <i>Geopelia placida</i> (Peaceful Dove)                 |  | <i>Gehyra dubia</i><br><i>Gehyra variegata</i> (Tree Dtella)  |
| Order Coraciiformes                                     |  | Family Scincidae  |
| Family Alcedinidae                                      |  | <i>Cryptoblepharus carnabyi</i><br><i>Egernia striolata</i> (Tree Skink)<br><i>Morethia boulengeri</i> (Boulenger's Skink)<br><i>Tiliqua scincoides</i> (Eastern Blue-tongued Lizard) |
| <i>Dacelo novaeguineae</i> (Laughing Kookaburra)        |  | Family Varanidae  |
| <i>Halcyon sancta</i> (Sacred Kingfisher)               |  | <i>Varanus varius</i> (Lace Monitor)  |
| Order Cuculiformes                                      |  | Order Testudines  |
| Family Cuculidae  |  | Family Chelidae   |
| <i>Cuculus pallidus</i> (Pallid Cuckoo)                 |  | <i>Chelodina longicollis</i> (Eastern Long-necked Tortoise)   |
| Order Falconiformes                                     |  |   |
| Family Accipitridae                                     |  |   |
| <i>Circus aeruginosus</i> (Marsh Harrier)               |  |   |
| <i>Haliastur sphenurus</i> (Whistling Kite)             |  |   |
| Family Falconidae                                       |  |   |
| <i>Falco berigora</i> (Brown Falcon)                    |  |   |
| <i>Falco cenchroides</i> (Australian Kestrel)           |  |   |
| <i>Falco longipennis</i> (Australian Hobby)             |  |   |
| Order Gruiformes  |  |   |
| Family Gruidae  |  |   |
| <i>Grus rubicundus</i> (Brolga)                         |  |   |
|   |  |   |